# United States Department of the Interior
## U.S. Fish and Wildlife Service
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In Reply Refer To:
AESO/ES
2-21-96-F-422 and 423

April 16, 1999

Memorandum

To: Deputy State Director, Resources Division, Bureau of Land Management, Arizona State Office, Phoenix, AZ

From: Field Supervisor

Subject: Amendments Number One to Biological Opinions for the Phoenix District Portion of the Eastern Arizona Grazing EIS and the Upper Gila-San Simon Grazing EIS

This is in response to your March 10, 1999, request for modifications to the proposed actions for the subject environmental impact statements and associated biological opinions (2-21-96-F-422 and 423). The biological opinions addressed ongoing grazing activities in 176 Bureau of Land Management (Bureau) allotments in eastern Arizona. The Fish and Wildlife Service found in the Phoenix District portion of the Upper Gila-San Simon biological opinion that the proposed action is not likely to jeopardize the continued existence of either the southwestern willow flycatcher, *Empidonax traillii extimus*; or the cactus ferruginous pygmy-owl, *Glaucidium brasilianum cactorum.* We also found that the proposed action was not likely to result in destruction or adverse modification of critical habitat designated for the southwestern willow flycatcher. In the biological opinion for the Phoenix District portion of the Eastern Arizona environmental impact statement, we found that the proposed action was not likely to jeopardize the continued existence of the southwestern willow flycatcher, cactus ferruginous pygmy-owl, Gila topminnow, *Poeciliopsis occidentalis occidentalis*, Little Colorado River spinedace, *Lepidomeda vittata*; and lesser long-nosed bat, *Leptonycteris curasoae yerbabuenae*; and was not likely to adversely modify or destroy critical habitat designated for the southwestern willow flycatcher and Little Colorado River spinedace. Both biological opinions were programmatic in nature, but did not provide evaluation of project level, or allotment-specific activities, and thus the Bureau committed in the project description to request consultation for each allotment within one year of the date of the opinions (by January 8, 1999 for the Upper Gila-San Simon opinion, and by March 4, 1999 for the Eastern Arizona opinion). In your March 10, 1999, memorandum, you proposed to request consultation on each allotment as the grazing permits come up for renewal, rather than as described in the biological opinions.

The proposed revision only changes the consultation process, not the grazing activities that may affect listed species and critical habitat, nor the way in which listed species or critical habitat may be affected. Thus, the revision does not alter our previous determinations that the proposed actions are not likely to jeopardize the continued existence of the listed species addressed, and is

not likely to result in adverse modification or destruction of critical habitat. Furthermore, the revision does not change our determinations in regard to anticipated take of listed animals. The "Description of the Proposed Action" in the above mentioned biological opinions are herein amended ( amendment number one of the two opinions) to read that the Bureau will develop and submit to the Service an allotment-specific biological evaluation as each grazing permit comes up for renewal.

With this revision to the proposed actions, the Bureau will delay consultation at the project level for some activities within allotments. Although this delay does not change expected effects to listed species and critical habitat, amendment of the opinions does not alter the Bureau's responsibilities under the Endangered Species Act. If ongoing grazing activities require a discretionary action by the Bureau, such as approving a range improvement project or an annual work plan, the effects of that action on listed species and critical habitat must be evaluated. If the action may adversely affect a listed species or critical habitat, the Bureau is required to request formal consultation with the Service [50 CFR 402.14(a) and (b)]. Rather than waiting to consult on allotments as permits expire, we recommend submitting a request or requests for programmatic consultation that would cover all grazing activities to the project level. Consistent with recommendations to streamline section 7, we prefer that as many allotments as possible be packaged into each consultation request. These requests for consultation could be tiered off the 1998 programmatic umbrella biological opinions.

We look forward to working with you on site-specific consultations for the Phoenix Field Office portions of the Eastern Arizona and Upper Gila-San Simon areas. Any questions in this matter may be referred to Jim Rorabaugh (x238) or Tom Gatz (x240) of my staff.

David L. Harlow

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (Attn: S. Chambers)

BLMgrz.wpd

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
P.O. Box 1306
Albuquerque, New Mexico 87103



In Reply Refer To:
R2/ES-HC

MAR 4 1998

2-21-96-F-422

Memorandum

To: District Manager, Bureau of Land Management, Phoenix, Arizona

From: Assistant Regional Director, Ecological Services, Region 2

Subject: Biological Opinion on the Phoenix District Portion of the Eastern Arizona Grazing Environmental Impact Statement

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed continued implementation of the Eastern Arizona Grazing Environmental Impact Statement, located in Apache, Navajo, Yavapai, Maricopa, Gila, and Pinal Counties, Arizona, on the Phoenix Bureau of Land Management District, and its effects on the southwestern willow flycatcher (*Empidonax traillii extimus*), the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), the Gila topminnow (*Poeciliopsis occidentalis occidentalis*), the Little Colorado River spinedace (*Lepidomeda vittata*), and the lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended, (16 U.S.C. 1531 et seq.).

This biological opinion is based on information provided in the September 18, 1996, biological evaluation, the Eastern Arizona Grazing Final Environmental Impact Statement (EIS) (1986), the Phoenix Resource Area Range Program Summary Update (1992) and other sources of information. A complete administrative record of this consultation is on file at the Service's Ecological Services Field Office in Phoenix, Arizona (AZESFO).

## FORMAT OF THE DOCUMENT

The remainder of this document is organized into the following major headings: Consultation History; Description of Proposed Action; Concurrence on Not Likely to Adversely Affect Determinations; Affected Species; Reinitiation Statement; and Bibliography. Under the section regarding affected species is found a biological

opinion for each species that may be adversely affected by the proposed action, as well as an incidental take statement.

## CONSULTATION HISTORY

The BLM requested the initiation of formal consultation on the proposed action on September 18, 1996, when the biological evaluation was submitted to the Service's AZESFO. In the biological evaluation, the BLM assessed the effects of continued implementation of the Eastern Arizona Grazing EIS on all listed species. A draft biological opinion was transmitted to the BLM on September 2, 1997, and written comments, dated October 31, 1997, were received by the Service on November 6, 1997. Those comments are considered in this document.

## DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the continuation of the grazing management plan described in the Eastern Arizona Grazing EIS of September 1986. The biological evaluation is programmatic in nature. Where conclusions are reached that implementation of the EIS may adversely affect a listed species on one or more allotments, conservation measures specify that a separate, specific biological evaluation will be developed within 1 year of the receipt of this biological opinion to ensure compliance with the Act.

The proposed action would be implemented on 162 grazing allotments in the Phoenix District. The allotments cover a total of 695,278 acres of public lands. Of the 162 allotments, 30 do not contain potential habitat for any threatened, endangered or proposed species. Decisions from the Final EIS and from the 1992 Phoenix Resource Area Range Program Summary Update that provide management direction and decisions that result in action are further analyzed for potential impacts to listed species on the remaining 132 allotments.

**Decisions that provide management direction include:**

a. Land that is presently unleased for livestock use would remain unleased, with vegetation reserved for wildlife and nonconsumptive use.

b. The 132 grazing allotments in the Phoenix Resource Area portion of the EIS Area, with occupied or potential habitat for threatened, endangered or proposed species, are assigned to one of three management categories based on present resource conditions and potential for improvement. The management categories are defined in the biological evaluation. Two "M"

allotments (34,940 acres) generally will be managed to "maintain" current satisfactory resource conditions; 3 "I" allotments (68,479 acres) generally will be managed to "improve" resource conditions; and 127 "C" allotments (484,054 acres) will receive "custodial" management due to small acreage of public land and/or limited resource conflicts. Seven of the "C" allotments are designated for ephemeral use only.

c. Allotment management plans will be developed or revised on 3 "I" allotments.

d. Allotments categorized as "I" will be the first priority for Allotment Management Plan (AMP) Development. Allotments categorized as "M" will be the second priority for AMP development. AMP development is subject to available funding.

e. Special emphasis will be given to improving riparian areas along the Agua Fria River and its tributaries as well as segments of the upper Hassayampa River and the Middle Gila River.

f. Long-term target Animal Unit Month figures (from increased vegetation production through revision of grazing systems already implemented, additional grazing systems and various land treatments) would be distributed on the basis of 40 percent to livestock and 60 percent to nonconsumptive uses.

Decisions that result in action include:

a. Grazing is authorized at levels presented in the EIS.

b. Grazing strategies, restrictions and range improvements on eight allotments have been proposed as part of a strategy to improve and protect riparian habitat for southwestern willow flycatchers along the Gila River. These project-specific actions are described in a separate biological evaluation currently undergoing review by the Service, and are not covered in the present biological opinion.

The BLM will prepare biological evaluations for grazing related activities on specific allotments or groups of allotments where these activities are determined to have a potential effect on southwestern willow flycatchers. These biological evaluations will be submitted to the Service for consultation within 1 year of receipt of this biological opinion. During the preparation of the next Range Program Summary Update, livestock grazing and potential habitat for this species will be factors utilized in prioritizing allotment categorization.

The BLM will prepare biological evaluations for grazing related activities on specific allotments or groups of allotments where they are determined to have adverse effects on the Arizona population of cactus ferruginous pygmy-owl. These biological evaluations will be submitted to the Service for consultation within 1 year of receipt of this biological opinion. During the preparation of the next Range Program Summary Update, potential conflicts between livestock grazing and potential habitat for this species will be a priority consideration during allotment categorization.

The BLM will prepare a biological evaluation for grazing related activities on the Boulder Creek allotment where grazing-related activities are determined to have adverse affects on Gila topminnow. This biological evaluation will be submitted to the Service for consultation under section 7 of the Act within 1 year of receipt of this biological opinion. All proposed action sites in Apache and Navajo Counties that potentially could impact riparian habitats will be surveyed specifically for this species. If a proposed project may impact this species, consultation with the Service will be initiated in compliance with the Act.

The BLM will prepare biological evaluations for grazing related activities on specific allotments or groups of allotments where grazing related activities are determined to have adverse affects on Little Colorado River spinedace (those 7 allotments listed in the determination). These biological evaluations will be submitted to the Service for consultation under section 7 of the Act within 1 year of receipt of this biological opinion.

The BLM will prepare biological evaluations for grazing-related activities on 5 allotments where these activities have a potential effect on lesser long-nosed bat potential foraging habitat. These biological evaluations will be submitted to the Service for consultation under section 7 of the Act within 1 year of receipt of this biological opinion. The BLM will continue to cooperate with the Arizona Game and Fish Department (AZGFD) in conducting surveys of potential bat roosts subject to available funding. During the project planning phase of all range improvement projects, project location and livestock concentration effects will be considered and potential impacts evaluated as part of the National Environmental Policy Act (NEPA) process. During the preparation of the next Range Program Summary Update, potential conflicts between livestock grazing and potential habitat for this species will be a priority consideration during allotment categorization.

The conclusion of this consultation with the issuance of this final biological opinion does not preclude the need for the BLM to consult with the Service on future site-specific project actions carried out under the Phoenix District portion of the Eastern Arizona Grazing EIS that: (1) The BLM determines "may affect" listed

species or designated critical habitat; and (2) have not completed formal section 7 consultation prior to finalization of this biological opinion.

Also considered as a part of the proposed action for this consultation are the Arizona Rangeland Health Standards approved by the Secretary of the Interior on April 28, 1997. Additionally, the BLM has offered new management direction to include specific conservation measures for the southwestern willow flycatcher and the cactus ferruginous pygmy-owl in Arizona. The BLM will implement these conservation measures in an ecosystem-based land management approach. A description of these measures follows:

Southwestern Willow Flycatcher

The new management direction includes specific conservation measures for the southwestern willow flycatcher (also referred to as willow flycatcher herein) and is designed to map suitable and potential habitat on BLM administered lands, survey habitats for their presence and provide protective measures for habitats which are currently suitable or have the potential to become suitable willow flycatcher habitat. These measures will be integrated with current management direction provided by the BLM's Riparian Management Policy and the Arizona Rangeland Health Standards and Guidelines. Both policies emphasize the importance of managing riparian systems in a proper functioning condition while enhancing potential natural communities.

The new management direction is incorporated into the consultations for:

- Lower Gila North Management Framework Plan (MFP)/Grazing EIS
- Lower Gila South Resource Management Plan (RMP) and 1988 Amendment
- Phoenix RMP
- **Eastern Arizona Grazing EIS**
- Upper Gila-San Simon Grazing EIS (Phoenix portion)
- Thirteen Allotments along the Gila River
- Kingman RMP reinitiation
- Yuma RMP

**Conservation Measures for Southwestern Willow Flycatcher**

The BLM in Arizona will develop and implement an action plan for the southwestern willow flycatcher that provides protective guidance for managing willow flycatcher habitat and implementing BLM authorized activities. This action plan will provide guidance to Arizona BLM Field Offices for implementing decisions authorized in their respective planning documents (RMP's, Management and Framework Plans,

and associated grazing EIS's). Minimal features of the plan will include the following.

1. Mapping: Maps that convey the following information about willow flycatcher habitat managed by the BLM Field Office:

   a. Location, size, shape, and spacing of habitat areas;

   b. Habitat stage with respect to willow flycatchers according to the following classification: suitable-occupied, suitable-unoccupied, suitable-unsurveyed, potential in the short term (1 to 3 years), and potential in the long-term (greater than 3 years);

   c. Status of willow flycatcher surveys for each area of suitable habitat: either the date(s) surveyed or indication that the area has not been surveyed.

2. Southwestern Willow Flycatcher Surveys: A list of areas to be surveyed following the most recent Service recommended protocol, along with the anticipated completion date for the survey of each area.

3. Habitat Management Guidelines: Management guidelines (fencing, grazing system used, or willow flycatcher habitat improvement activities) for areas at each of the habitat stages defined above for mapping. These guidelines should include:

   a. Exclusion of livestock grazing within occupied or unsurveyed, suitable habitat during the breeding season (April 1-September 1).

   b. Management of suitable willow flycatcher habitat so that its suitable characteristics are not eliminated or degraded.

   c. Management of potential willow flycatcher habitat to allow natural regeneration (through natural processes) into suitable habitat.

4. Cowbird Control: To reduce the likelihood of nest abandonment and loss of southwestern willow flycatcher productivity owing to cowbird parasitism associated with BLM-authorized grazing activities in or near occupied habitats, BLM will implement the following:

   a. Investigate and identify livestock concentration areas on BLM lands in the action areas that are likely foraging areas for brown-headed cowbirds within a 5-mile radius of occupied or unsurveyed suitable southwestern

willow flycatcher habitat, and evaluate ways to reduce any concentration areas found.

b. If cowbird concentrations indicate a strong likelihood that parasitism to willow flycatcher nests is occurring, or actual parasitism is documented through nest monitoring, possible cowbird foraging areas will be assessed, and appropriate control measures for cowbirds will be implemented. Evaluation of possible parasitism applies to active willow flycatcher nests on BLM-administered lands which are within 5 miles of BLM-authorized grazing activities. These efforts will be coordinated with the Service and the U.S. Animal and Plant Health Inspection Service (APHIS). Monitoring and/or control activities will be conducted by qualified personnel with appropriate permits.

Cactus Ferruginous Pygmy-Owl

Conservation measures that provide additional management direction for the cactus ferruginous pygmy-owl (also referred to as pygmy-owl herein) also have been developed by the BLM in Arizona. These measures will map suitable habitats, conduct surveys to determine the presence of birds in these areas, and maintain habitat features in suitable habitats that are necessary to support breeding populations. The habitat and survey data obtained through this process will be used in an interagency effort to refine the Service's initial habitat profile and known species distribution in Arizona. Additional knowledge will also allow for refinements in mapping of suitable habitat and development of management prescriptions.

The new management direction is incorporated into the consultations for:

- Lower Gila North MFP/Grazing EIS
- Lower Gila South RMP and 1988 Amendment
- Lower Gila South RMP, Barry Goldwater Amendment
- Phoenix RMP
- **Eastern Arizona Grazing EIS**
- Upper Gila-San Simon Grazing EIS (Phoenix portion)
- Thirteen Allotments along the Gila River

**Conservation Measures for Cactus Ferruginous Pygmy-owl**

1. Habitat Description: The BLM in Arizona will work with the Service, the U.S. Forest Service, and Arizona Game and Fish Department in a cooperative effort to refine the Service's habitat profile and delineation of distribution for the pygmy-owl. The habitat profile will include habitat features necessary to

support breeding populations for pygmy owls and a profile for the subset of Sonoran desert scrub that is likely to support cactus ferruginous pygmy-owls.

2. Mapping: Map suitable habitat within the planning area based on the Service's most current habitat profile and distribution map (within 3 years).

3. Survey: Survey for the presence of cactus ferruginous pygmy owls on BLM-administered lands over all mapped areas of suitable habitat within a time frame identified in an action plan developed in cooperation with the Service. Priorities for survey include:

   a. Survey before any habitat disturbing activity (this applies to all suitable habitat, regardless of the status of the mapping effort described in number 2 above);

   b. Areas in proximity to occupied or recently (within the last 10 years) occupied habitat;

   c. Historic localities; and

   d. Likely historic habitat, based on historic localities and the habitat profile.

4. Habitat Management: Maintain habitat features necessary to support breeding populations of the cactus ferruginous pygmy-owls within their historic range:

   a. Maintain essential habitat features on suitable habitat as identified in the most current Service-approved habitat profile for the pygmy owl.

   b. Review ongoing activities for effects on essential habitat features needed by pygmy-owls, and modify activities, where necessary, to sustain the overall suitability of the habitat for cactus ferruginous pygmy-owls. Priority will be given to activities in or near occupied or recently (within the last 10 years) occupied habitat.

5. Management direction for the cactus ferruginous pygmy owl (including such things as habitat profiles, habitat categorization, mapping, and surveys) will be reviewed with the Service annually. Adjustments will be made, as necessary, based on these findings, other new information, or accepted recovery prescriptions.

## CONCURRENCE ON NOT LIKELY TO ADVERSELY AFFECT DETERMINATIONS

According to the September 18, 1996, biological evaluation, the BLM has determined that the proposed action "may adversely affect" the southwestern willow flycatcher, the cactus ferruginous pygmy-owl, the Gila topminnow, the Little Colorado River spinedace, and the lesser long-nosed bat. The biological evaluation included determinations that the proposed action "may affect, but is not likely to adversely affect" the bald eagle (*Haliaeetus leucocephalus*), the peregrine falcon (*Falco peregrinus*), Parish's alkali grass (*Puccinellia parishii*), Peebles Navajo Cactus (*Pediocactus peeblesianus v. peeblesianus*), Arizona hedgehog cactus (*Echinocereus triglochidiatus v. arizonicus*), and the desert pupfish (*Cyprinodon macularius*). The Service herein concurs with these determinations.

## BIOLOGICAL OPINION

### AFFECTED SPECIES

#### SOUTHWESTERN WILLOW FLYCATCHER (*Empidonax traillii extimis*)

##### Status of the Species (Range-wide)

The southwestern willow flycatcher was proposed for listing as endangered, with critical habitat, on July 23, 1993. A final rule listing the species as endangered was published on February 27, 1995, and a final designation of critical habitat was published on July 22, 1997. The following information is developed from a compilation of published and unpublished data.

The southwestern willow flycatcher is a small passerine bird. It is a neotropical migratory species that breeds in the southwestern U.S. and migrates to Mexico, Central America, and possibly northern South America during the non-breeding season. The historical range of the southwestern willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja California).

##### Life History

The southwestern willow flycatcher is a small riparian obligate bird, nesting along rivers, streams, and other wetlands where dense growths of willow (*Salix* sp.), *Baccharis*, buttonbush (*Cephalanthus* sp.), boxelder (*Acer negundo*), saltcedar

(*Tamarix* sp.) or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.) and/or willow. The species is an insectivore, foraging within and above dense riparian vegetation, taking insects on the wing or gleaning them from foliage.

Birds begin arriving on breeding grounds in late April and May. Migration routes are not completely known. However, willow flycatchers have been documented migrating through specific locations and drainages in Arizona that do not currently support breeding populations, including the upper San Pedro River, Colorado River through Grand Canyon National Park, lower Colorado River, Verde River tributaries, and Cienega Creek. These observations probably include subspecies *E.t. brewsteri* and *E.t. adastus*. *Empidonax* willow flycatchers rarely sing during fall migration, so that a means of distinguishing some migrating *Empidonax* without a specimen is not feasible. However, willow flycatchers have been reported to sing and defend winter territories in Mexico and Central America.

Southwestern willow flycatchers begin nesting in late May and early June and fledge young from late June through mid-August. Southwestern willow flycatchers typically lay three to four eggs in a clutch (range = 2-5). The breeding cycle, from laying of the first egg to fledging, is approximately 28 days. Eggs are laid at 1-day intervals; they are incubated by the female for approximately 12 days; and young fledge approximately 12 to 13 days after hatching. Southwestern willow flycatchers typically raise one brood per year but have been documented raising two broods during one season. Southwestern willow flycatchers have also been documented renesting after nest failure.

Survivorship of adults and young have been reported as: of 58 nestlings banded since 1993, 21 (36 percent) returned to breed; of 57 birds banded as adults (after hatch year) since 1989, 18 (31 percent) returned to breed at least 1 year (10 males, 8 females), 5 (9 percent) returned to breed for 2 years (all males), and 2 (3.5 percent) returned to breed for 3 years. A statistically significant variation in return rates of juveniles also has been documented as a function of fledging date; approximately 21.9 percent of juveniles fledged on or before July 20 returned to the study area the following year, whereas only 6.4 percent of juveniles fledged after July 20 returned the following year.

Range-wide, occupied habitat for the southwestern willow flycatcher can be characterized by dense patches of riparian shrubs or trees including stands of native vegetation and occasionally exotic vegetation. The size and shape of occupied riparian habitat patches vary considerably. Southwestern willow flycatchers have been found nesting in patches as small as 0.8 ha (e.g., Grand Canyon) and as large as several hundred hectares (e.g., Roosevelt Lake and Lake Mead). When viewed from above, mixed vegetation types often appear as a mosaic of plant species and

patch shapes and sizes. In contrast, narrow, linear riparian habitats one or two trees wide do not appear to contain attributes attractive to nesting flycatchers. However, willow flycatchers have been found using these habitats during migration.

Open water, cienegas, marshy seeps, or saturated soil are typically in the vicinity of willow flycatcher nests. Southwestern willow flycatchers have been documented nesting in areas where nesting substrates were in standing water. At some locations, particularly during drier years, water or saturated soil is only present early in the breeding season (i.e. May and part of June). However, the total absence of water or visibly saturated soil has been documented at sites where the river channel has been modified (e.g. creation of pilot channels), where modification of subsurface flows has occurred (e.g. agricultural runoff), or as a result of natural changes in river channel configuration.

Southwestern willow flycatcher nests are typically placed in the fork of a branch with the nest cup supported by several small-diameter vertical stems. The main branch from which the fork originates may be oriented vertically, horizontally, or at an angle, and stem diameter for the main supporting branch can be as small as three to four cm. Vertical stems supporting the nest cup are typically one to two cm in diameter. Occasionally, southwestern willow flycatchers place their nests at the juncture of stems from separate plants, sometimes different plant species. Those nests are also characterized by vertically-oriented stems supporting the nest cup. Nest height relative to the base of nest substrate also varies across the southwestern willow flycatcher's range.

Willow flycatchers using predominantly native broadleaf riparian habitats nest relatively low to the ground (between 1.8 m and 2.1 m on average), whereas those using mixed native/exotic and monotypic exotic riparian habitats nest relatively high above the ground (between 4.3 m and 7.4 m on average). Historic egg/nest collections and species' descriptions from throughout the southwestern willow flycatcher's range confirm the bird's widespread use of willow for nesting.

Population Dynamics

Intensive nest monitoring efforts in California, Arizona, and New Mexico have revealed that: (1) Sites with both relatively large and small numbers of pairs have experienced extremely high rates of brood parasitism; (2) high levels of cowbird parasitism in combination with nest loss due to predation have resulted in low reproductive success and, in some cases, population declines; (3) at some sites, levels of cowbird parasitism remain high across years, while at others parasitism varies temporally with cowbirds absent in some years; (4) the probability of a willow flycatcher successfully fledging its own young from a nest that has been

parasitized by cowbirds is low (i.e., < 5 percent); (5) cowbird parasitism and nest loss due to predation often result in reduced fecundity in subsequent nesting attempts, delayed fledging, and reduced survivorship of late-fledged young; and, (6) nest loss due to predation appears more constant from year to year and across sites, generally in the range of 30 to 50 percent.

Besides lowering nest success, fecundity, and the number of young produced, cowbird parasitism may also lower survivorship of willow flycatcher young.fledged late in the season. Southwestern willow flycatchers that abandon parasitized nests, or renest after fledging cowbirds, lay fewer eggs in subsequent clutches and, if successful, fledge willow flycatcher young late in the season. Cowbird parasitism delayed successful willow flycatcher nesting by at least 13 days and this delay resulted in significantly different return rates of juveniles. Only 6.4 percent of willow flycatcher young that came from late nests were recaptured in subsequent years, whereas 21.9 percent of young that came from early nests were recaptured. If these recapture rates mirror actual survivorship, then even though some parasitized willow flycatchers eventually fledge their own young, nest loss due to parasitism or depredation may have the more insidious effect of reducing overall juvenile survivorship.

Cowbird parasitism and nest depredation are adversely affecting southwestern willow willow flycatchers throughout their range. Cowbirds have been documented at more than 90 percent of sites surveyed. Parasitism rates have been highly variable, at the same sites, from one year to the next. Thus, the potential for cowbirds to be a persistent and widespread threat remains high.

Status and Distribution

*E.t. extimus* was first described from a specimen collected by Gale Monson on the lower San Pedro River near Feldman, AZ. The taxonomic validity of *E.t. extimus* was subsequently reviewed and has been accepted by most authors. Historical and contemporary records of *E.t. extimus* have been reviewed throughout its range, revealing that the species has "declined precipitously . . . " and that "although the data reveal no trend in the past few years, the population is clearly much smaller now than 50 years ago, and no change in the factors responsible for the decline seem likely."

The loss of more than 70 breeding locations range-wide has been documented, including locations along the periphery and within core drainages that form this subspecies' range. Range-wide estimates of the southwestern willow flycatcher population were found to be comprised of 500 to 1,000 pairs. Since 1992 more than 800 historic and new locations have been surveyed range-wide to document the status of the southwestern willow flycatcher (some sites in southern California

have been surveyed since the late 1980's). Survey efforts in most states were done under the auspices of the Partners In Flight program, which served as the coordinating body for survey training sessions and review and synthesis of data. The extensive and, in some case, intensive nature of these efforts have provided a critical baseline for the current distribution, abundance, and reproductive success of southwestern willow flycatchers range-wide.

Range-wide, the current known population of southwestern willow flycatchers stands at 454 territories. This indicates a critical population status; more than 75 percent of the locations where willow flycatchers have been found are composed of five or fewer territorial birds and up to 20 percent of the locations are comprised of single, unmated individuals. The distribution of breeding groups is highly fragmented, with groups often separated by considerable distances (e.g., approximately 88 km straight-line distance between breeding willow flycatchers at Roosevelt Lake, Gila County, Arizona, and the next closest breeding groups known on either the San Pedro River (Pinal County) or Verde River (Yavapai County). Additional survey effort, particularly in southern California, may discover additional small breeding groups. However, range-wide survey efforts have yielded positive results in less than 10 percent of surveyed locations. Moreover, survey results reveal a consistent pattern range-wide: the southwestern willow flycatcher population as a whole is comprised of extremely small, widely-separated breeding groups or unmated willow flycatchers.

The Service has recently completed consultation on a number of Federal actions range-wide which result in additional habitat losses. These include:

In California, a section 7 consultation on the operations of Lake Isabella (Kern County) provided for complete, long-term inundation of the 485-ha South Fork Wildlife Area, also proposed critical habitat for the willow flycatcher. The Wildlife Area represents a significant recovery area occupied by 8 to 10 pairs of willow flycatchers prior to inundation and lies downstream of one of California's largest southwestern willow flycatcher breeding groups on the Kern River Preserve.

In Arizona, the Bureau of Reclamation was provided maximum flexibility in operating the new conservation space at Roosevelt Lake, which at capacity would totally inundate the riparian stands occupied by Arizona's largest breeding group). On the lower Colorado River, the 445-ha Goodding's willow stand at the inflow to Lake Mead has been partially inundated since September 1995. Despite partial inundation, approximately eight pairs of willow flycatchers were documented nesting at the inflow during the 1996 breeding season.

Status of the Species (In the Action Area)

All of the riparian habitats along all of the streams in the action area have been evaluated to determine habitat potential for southwestern willow flycatchers. The criteria used to evaluate these areas are based on conversations with Service and AZGFD biologists, and on habitat characteristics from known locations for this species. Potential habitat as identified by BLM includes areas that may currently be suitable as well as areas that have the potential to provide suitable habitat in the future (Tim Hughes, pers. comm.). The areas considered potential habitat in the action area include all of the Gila River, portions of Silver Creek (tributary of the Little Colorado River), and portions of the Little Colorado River.

Willow flycatcher surveys were conducted in 1993, 1995, and 1996 along portions of the Agua Fria River, tributaries of the Agua Fria River including: Dry Creek, Little Ash Creek, Sycamore Creek, Indian Creek, Silver Creek, Cow Creek, Humbug Creek and Tule Creek; the Hassayampa River and the Gila River. Southwestern willow flycatchers were recorded along the lower 21.5 miles of the Gila River above the Ashurst-Hayden diversion dam during 1995 and 1996 survey efforts. The Little Colorado River and its tributary, Silver Creek, have not been surveyed using the established protocol. Volunteer survey efforts in 1993 located no *Empidonax* willow flycatchers.

Effects of the Action

Activities that disturb, remove, or modify primary willow flycatcher habitat characteristics may adversely affect the willow flycatcher. Present and historic overuse by livestock has been a major factor in the degradation and modification of riparian habitats in the western U.S. Livestock grazing can have direct effects on nesting southwestern willow flycatchers by degrading habitat required by willow flycatchers. Livestock can open up the understory within riparian areas making it less suitable for willow flycatchers. Livestock tend to follow trails through the dense understory vegetation which degrades potential habitat for the willow flycatchers, fragments the habitat and increases the edge effect on the habitat area. Overgrazing by livestock on upland habitats can contribute to riparian degradation by increasing runoff and erosion that can result in catastrophic scouring floods that alter or destroy potential habitat for this species. Flooding is a natural occurrence, while destroying riparian habitat, it triggers regeneration of many riparian plant species.

Livestock grazing in the vicinity of nesting southwestern willow flycatchers can have indirect effects on the species by attracting brown-headed cowbirds. Brown-headed cowbirds are nest parasites known to use willow flycatchers as a host species. Livestock trails through the understory can increase the habitat edge

effect facilitating access to willow flycatcher nests by cowbirds. Cowbirds can move long distances between foraging and nesting areas. Excluding livestock grazing from the river bottom will not remove the threat of nest parasitism but may reduce it by improving the habitat quality (density and continuity). Habitat patches and adjacent mesquite and salt cedar patches will not have cow trails through them to provide cowbird access to willow flycatcher nesting areas if livestock are excluded. Brown-headed cowbirds are common throughout the action area. They are associated with cattle foraging on public lands as well as pastured cattle on private lands. Their occurrence in some areas is not associated with cattle, e.g,. cultivated private lands.

These potential adverse impacts are unlikely to continue or be realized under the proposed action because of direction provided in the EIS, the Arizona Rangeland Health Standards and Guidelines, and the new direction for management of southwestern willow flycatchers. Decision 3e of the EIS directs that special emphasis be given to improving riparian areas along the Agua Fria River and its tributaries as well as segments of the upper Hassayampa River and the Middle Gila River. The Rangeland Health Standards and Guidelines provide criteria for function of riparian habitats with adequate vegetation and for plant community objectives. The new management direction for willow flycatchers provides for survey and mapping of willow flycatchers and their habitat, which should identify any conflicts with grazing. The direction also provides for protection of willow flycatcher habitat features and control of cowbirds where they are identified as a problem for willow flycatchers.

## Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Loss of southwestern willow flycatcher habitat on non-Federal lands continues due to urbanization, agricultural clearing, livestock grazing, and other habitat-altering activities range-wide. Mixed land ownership in the action area of this proposal limit BLM's ability to control cowbirds.

## Conclusion

After reviewing the current status of the southwestern willow flycatcher, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that continued

implementation of the Eastern Arizona Grazing EIS, as proposed, is not likely to jeopardize the continued existence of the southwestern willow flycatcher or destroy or adversely modify its critical habitat. Protection provided in the proposed action should result in protection of existing willow flycatchers and an increase in suitable habitat through protection of potential habitat.

## Incidental Take Statement

Sections 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

### Amount or Extent of Take

With the BLM's implementation of the conservation measures to provide management direction for southwestern willow flycatchers in the Phoenix portion of the Eastern Arizona Grazing EIS planning area, the Service does not anticipate that the proposed action will take any southwestern willow flycatchers.

## Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Establish a partnership with nonfederal landowners on the 35 grazing allotments to extend cowbird trapping efforts onto private property as appropriate for protection of breeding willow flycatchers.

## CACTUS FERRUGINOUS PYGMY-OWL (*Glaucidium brasilianum cactorum*)

### Status of the Species (Range-wide)

A complete list of references used in the development of this section may be obtained from the AZESFO and is a part of the administrative record for this consultation.

The Service included the cactus ferruginous pygmy-owl *(Glaucidium brasilianum cactorum*) on its Animal Notice of Review as a category 2 candidate species throughout its range on January 6, 1989 (54 FR 554). After soliciting and reviewing additional information, the Service elevated the subspecies to category 1 status throughout its range on November 21, 1991 (56 FR 58804). A category 1 species was, at that time, defined as a species for which the Service has on file substantial information to support listing, but for which a proposal to list has not been issued as it is precluded at present by other listing activities. The Service no longer uses these categories, but instead maintains one candidate list (61 FR 64481, December 5, 1996).

On May 26, 1992, a coalition of conservation organizations petitioned the Service, requesting listing of the pygmy-owl as an endangered subspecies under the Act. The petitioners also requested designation of critical habitat. In accordance with section 4(b)(3)(A) of the Act, on March 9, 1993, the Service published a finding that the petition presented substantial scientific or commercial information indicating that listing may be warranted, and initiated a status review on the pygmy-owl (58 FR 13045). In conducting its status review, the Service solicited additional comments and biological data on the status of the cactus ferruginous pygmy-owl, through mailings, a notice in the Federal Register (58 FR 13045), and other means. Listing was finalized on March 10, 1997, and was effective on April 9, 1997. Critical habitat was determined to be not prudent in the final rule.

The cactus ferruginous pygmy-owl (Order Strigiformes--Family Strigidae) is a small bird, approximately 17 cm (6 3/4 in). Males average 62 g (2.2 oz), and females average 75 g (2.6 oz). The cactus ferruginous pygmy-owl is reddish-brown overall, with a cream-colored belly streaked with reddish-brown. Some individuals are grayish, rather than reddish-brown. The crown is lightly streaked, and paired black-and-white spots on the nape suggest eyes. There are no ear tufts, and the eyes are yellow. The tail is relatively long for an owl and is colored reddish-brown with darker brown bars. The call of this diurnal owl, heard primarily near dawn and dusk, is a monotonous series of short notes.

The cactus ferruginous pygmy-owl is one of four subspecies of the ferruginous pygmy-owl. It occurs from lowland central Arizona south through western Mexico,

to the States of Colima and Michoacan, and from southern Texas south through the Mexican States of Tamaulipas and Nuevo Leon. The northernmost record for the cactus ferruginous pygmy-owl is from New River, Arizona, approximately 55 km (35 mi) north of Phoenix. South of these regions and through Central America, *G. b. ridgwayi* replaces *G. b. cactorum*. Throughout South America, *G. b. brasilianum* is the resident subspecies. Also, a fourth subspecies of pygmy-owl (*G. b. stranecki*) has been identified from central Argentina.

The cactus ferruginous pygmy-owl was described in 1937, based on specimens from Arizona and Sonora. It is distinguished from *G.b. ridgwayi* and *G.b. brasilianum* by its shorter wings and longer tail, and by generally lighter coloration). *G.b. cactorum* occurs in several color phases, with distinct differences between regional populations. Some investigators have suggested that further taxonomic investigation is needed, primarily to determine whether the current *G. b. cactorum* comprises more than one subspecies.

*G.b. cactorum* is widely recognized as a valid subspecies. The American Ornithologists' Union (AOU) recognized *G.b. cactorum* in its 1957 *Checklist of North American Birds*, but subsequent AOU lists did not address subspecies.

The cactus ferruginous pygmy-owl nests in a cavity in a tree or large columnar cactus. Cavities may be naturally formed (e.g., knotholes) or excavated by woodpeckers. No nest lining material is used. The cactus ferruginous pygmy-owl has also nested in fabricated nest boxes. Three, four, five, and occasionally six eggs are laid and are incubated for approximately 28 days. The young fledge about 28 days after hatching. The cactus ferruginous pygmy-owl begins nesting activities in late winter to early spring.

The cactus ferruginous pygmy-owl occurs in a variety of subtropical, scrub, and woodland communities, including river bottom woodlands, woody thickets ("bosques"), coastal plain oak associations, thornscrub, and desertscrub. Unifying habitat characteristics among these communities are fairly dense woody thickets or woodlands, with trees and/or cacti large enough to provide nesting cavities.

Throughout its range, the cactus ferruginous pygmy-owl occurs at low elevations, generally below 1,200 m or about 4,000 ft. In the western portion of its range, the cactus ferruginous pygmy-owl appears to use riparian woodlands and bosques dominated by mesquite and cottonwood, Sonoran Desertscrub (usually with relatively dense saguaro cactus forests), and Sinaloan Deciduous Forest. The cactus ferruginous pigmy-owl also has been found in thickets of intermixed mesquite and saguaro cactus near the New River, Arizona. Prior to the mid-1900's, the cactus ferruginous pygmy-owl was also described as not "uncommon", "of common occurrence," and "fairly numerous" resident of lowland

central and southern Arizona in cottonwood forests, mesquite-cottonwood woodlands, and mesquite bosques along the Gila, Salt, Verde, San Pedro, and Santa Cruz rivers, and various tributaries. Several birds have been taken along Rillito Creek near Fort Lowell, in the vicinity of Tucson, Arizona. The cactus ferruginous pygmy-owl also occurs in Sonoran Desertscrub associations in southern and southwestern Arizona, comprised of paloverde, ironwood, mesquite, acacia, bursage, and columnar cacti such as the saguaro and organpipe.

In the past, the cactus ferruginous pygmy-owl's occurrence in Sonoran Desertscrub was apparently less common and predictable. It was more predictably found in xeroriparian habitats (very dense desertscrub thickets bordering dry desert washes) than more open, desert uplands. The cactus ferruginous pygmy-owl also has been noted to occur at isolated desert oases supporting small pockets of riparian and xeroriparian vegetation.

Both riparian and desertscrub habitats are likely to provide several requirements of the cactus ferruginous pygmy-owl's ecology. Trees and large cacti provide cavities for nesting and roosting. Also, these habitats along watercourses are known for their high density and diversity of animal species that constitute the cactus ferruginous pygmy-owl's prey base. In addition, the dense vegetation along these washes provides protective cover from aerial predators.

Since the cactus ferruginous pygmy-owl was recently listed, only a few consultations have been completed or are underway for this species. Loss and modification of nesting habitat is one of the primary threats to this species, especially on private land. The extent of this loss may be reflected in the extremely low population size of this bird in Arizona. It is estimated that between 85 to 90 percent of low-elevation riparian habitats in the southwestern U.S. have been modified or lost. These alterations and losses are attributed to urban and agricultural encroachment, wood cutting, water diversion and impoundment, channelization, livestock overgrazing, groundwater pumping, and hydrologic changes resulting from various land-use practices.

Fewer than 20 verified records of cactus ferruginous pygmy-owls in Arizona for the period of 1971 to 1988. In 1992, surveys located three single cactus ferruginous pygmy-owls in Arizona. More extensive surveys in 1993 again located three single cactus ferruginous pygmy-owls in Arizona. During 1993 - 1994 surveys, one pair of cactus ferruginous pygmy-owls was detected in north Tucson, near the sightings of 1992 and 1993. Two individual owls were found in northwest Tucson during 1995 surveys, and an additional owl was detected at Organ Pipe Cactus National Monument. In 1996, the AZGFD focused survey efforts in northwest Tucson and Manana, and detected a total of 17 birds. Results of the 1997 survey season indicate 12 cactus ferruginous pygmy-owls statewide.

Status of the Species (In the Action Area)

Historical occurrences of this species within the action area exist along the Gila River and the New River. Potential habitat for this species within the action area occurs wherever trees and/or cactus are large enough to provide cavities for nesting. Potential habitat occurs along the Gila River forested riparian and mesquite bosque habitats as well as desert washes and upland areas with saguaro cactus. There have been no individuals of this species located within the action area, but no systematic surveys have occurred.

Effects of the Action

Implementation of the Eastern Arizona EIS may adversely affect the cactus ferruginous pygmy-owl from livestock grazing and associated activities on 48 allotments.

Livestock grazing can degrade riparian habitat condition by limiting recruitment of trees upon which this species depends for nest sites and which provide habitat for its prey species. Livestock can browse on young trees along streams and washes reducing recruitment of these trees. Overgrazing of uplands can contribute to increased runoff and erosion that can scour away potential habitat plants. Livestock may inhibit survival of saguaro cactus, which provide potential nesting habitat for this species by trampling seedlings under nurse plants (palo verde, ironwood, mesquite, etc.), by grazing nurse plants and removing protective cover, or by grazing the seedlings themselves. This effect is most likely to occur on relatively flat terrain.

These impacts are tempered by policy and guidance decisions in the EIS that emphasize the improvement of watershed and riparian conditions. In addition, the new direction for pygmy-owl management provides for survey and mapping of pygmy-owls and their habitat, which should identify potential conflicts between the species and grazing activities.

Additional direction to maintain essential habitat features should ensure that grazing activities are carried out consistent with the conservation of the pygmy-owl.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Potential habitat for this species occurs over an extremely large area. Large areas of potential habitat occur on State and private lands where future development is likely. Habitat loss and manipulation are continuing threats to this species. Livestock grazing, with its potentially adverse effects, occurs on much of the potential habitat in Arizona. Year-round livestock grazing on the San Carlos Indian Reservation occurs within the floodplain of the Gila River on two allotments within the action area.

Conclusion

After reviewing the current status of the cactus ferruginous pygmy-owl, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Eastern Arizona Grazing EIS, as proposed, along with the new management direction, is not likely to jeopardize the continued existence of the cactus ferruginous pygmy-owl. Although there is potential habitat for pygmy-owls in the action area, no owls are known to inhabit the area and direction to survey for pygmy-owls and protect essential habitat features should avoid impacts to the species.

Incidental Take Statement

Sections 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

**Amount or Extent of Take**

With the BLM's immediate implementation of the conservation measures to provide management direction, the Service does not anticipate the proposed action will incidentally take any cactus ferruginous pygmy-owls.

Conservation Recommendations

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for cactus ferruginous pygmy-owl. In furtherance of the purposes of the Act, we recommend implementing the following actions:

1. The BLM should coordinate with the Service on the development of emergency protocols for response actions that occur within pygmy-owl habitat, or may otherwise affect the pygmy-owl on the BLM lands, to develop possibilities for the minimization of impacts to and/or protection for the pygmy-owl.

2. The BLM should consider adding specific habitat protection guidance based on the conservation measures to the EIS when it is next amended, or in future, comparable document that covers the planning area.

3. The BLM should consider providing ACEC status to cactus ferruginous pygmy-owl habitat in the next planning cycle for the EIS planning area.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendation.

## GILA TOPMINNOW (*Poeciliopsis occidentalis*)

### Status of the Species (Range-wide)

The Gila topminnow was listed as an endangered species on March 11, 1967, without critical habitat. The Gila topminnow is a small, livebearing fish found in the Gila, Sonora, and de la Concepcion River drainages in Arizona, New Mexico, and Sonora, Mexico (Minckley 1973, Vrijenhoek et. al. 1985). It was once among the commonest species of the Gila River and its tributaries (Hubbs and Miller 1941). Destruction of its habitat through water diversion, stream downcutting, backwater draining, vegetation clearing, channelization, water impoundment, and other human uses of the natural resources and competition with and/or predation by nonnative fish species, most notably mosquitofish (*Gambusia affinis*), have resulted in

extirpation of the Gila topminnow throughout most of its range (USFWS 1984, Meffe et. al.).

Gila topminnow and many other poeciliids can tolerate a wide variety of physical and chemical states. They are good colonizers in part because of this tolerance and in part because one gravid female can start a population (Meffe and Snelson 1989). Minckley (1969, 1973) described their habitat as edges of shallow aquatic habitats, especially where abundant aquatic vegetation exists.

Gila topminnows are known to occur in streams fluctuating from 6 to 37°C, pH from 6.6 to 8.9, dissolved oxygen levels of 2.2 to 11 mm/liter, and can tolerate salinities approaching those of sea-water (Meffe et. al. 1982). Topminnows can burrow under mud or aquatic vegetation when water levels decline (Deacon and Minckley 1974, Meffe et. al. 1983). Sonoran topminnows regularly inhabit springheads with high loads of dissolved carbonates and low pH (Minckley et. al. 1977, Meffe 1983, Meffe and Snelson 1989). This factor has helped protect small populations of topminnows from mosquitofish which are usually rare or absent under these conditions.

Status of the Species (In the Action Area)

In the U.S. the Gila topminnow has a historic range that includes the Gila River and tributaries from New Mexico to the Colorado River.

Gila topminnow occur on public land in Tule Creek on the Boulder Creek and Two Shoe allotments and on State land in AD Wash on the 11 L allotment. This species was introduced widely in the 1970's and 1980's. Most of the introduced populations did not persist. These are two of the approximately 21 introduced populations that persist. Locations where this species once occurred but no longer

exists include Cow Creek and Humbug Creek on the Two Shoe allotment (withdrawn from grazing) and Castle Creek on the Bumble Bee allotment.

The Tule Creek population was originally stocked in 1968 and supplementally stocked in 1981 following floods in 1978. The AD Wash population was stocked in 1993. Both stockings were made with mixed stock from Monkey-Cocio-Bylas by way of Boyce-Thompson Arboretum. The Tule Creek population underwent a significant population decrease following floods during January 1993. The population has recovered to the point where topminnow are common in permanent water throughout the area.

Most of the perennial reach of Tule Creek is fenced and was excluded from livestock grazing in 1991. Shortly after the fence was constructed, the water

backed upstream and dried up below the exclosure. In 1991, a pipeline and drinker were installed to provide water for livestock outside the exclosure. During the following 2 years, the exclosure experienced repeated vandalism followed by maintenance. In 1993 floods scoured the channel, taking out both the upper and lower water gaps. During the Summer of 1993, BLM rebuilt the water gaps, installed pipe rail fences, a swinging steel gate and a interpretive sign. Since that time, vandalism has been minimal and the exclosure has remained intact. The permanent water now persists further upstream and downstream than it did prior to fencing. Topminnow currently occur in dense concentrations throughout the stream within the exclosure and downstream of the exclosure for approximately 0.25 mile to the road crossing. Since the upper 0.5 mile of the stream with permanent water was fenced, the stream has apparently recharged and flows up to approximately 0.5 mile further downstream than it did prior to fencing.

The total additional flow length varies from year-to-year depending on the hydrologic regime. The 300 meters of occupied habitat below the exclosure did not exist prior to construction of the exclosure.

The AD Wash population appears to be stable (Kirk Young, AGFD, pers. comm.). The entire reach with permanent water is occupied by topminnow. The habitat occupied by topminnow in AD Wash is within a narrow canyon, inaccessible to livestock.

Introductions of topminnow were widespread during the late 1970's and early 1980's. Topminnow were introduced into Bench Well on the Prescott National Forest and washed downstream into Castle Creek on BLM administered lands. The fish persisted there for several years. The habitat in Castle Creek dried up in 1989. Recent surveys of Bench Well have not documented topminnow (Dave Weedman, AZGFD, pers. comm.).

Topminnow introduced into Cow Creek on private land washed downstream onto lands administered by BLM. The fish persisted for several years in Cow and Humbug Creeks but have not been collected in these streams following a scouring flood during the winter of 1992. BLM has sampled both streams extensively every year since the flood. Cow and Humbug Creeks are occupied by two species of exotic fish, green sunfish (*Lepomis cyanellus*) and fathead minnow (*Pimephales promelas*). Recent surveys of the original stocking location on Cow Creek have not documented topminnow (Dave Weedman, AZGFD, pers. comm.). Topminnow are not yet considered extirpated from Castle Creek, Cow Creek and Humbug Creek but stocking efforts in these locations are considered unsuccessful.

Potentially suitable reintroduction habitat for this species occurs in many areas of the EIS planning area within the historic range of the species.

## Effects of the Action

Continued implementation of the Eastern Arizona Grazing EIS may adversely affect Gila topminnow that currently occur in an approximately 300 meter stretch of Tule Creek downstream of the exclosure on the Boulder Creek allotment. Livestock cannot access the topminnow habitat on the 11 L allotment, therefore grazing would have insignificant effects on the AD Wash population.

### Direct Effects

Cattle tend to congregate along streams during the summer. Along this 300 meter reach, cattle could potentially trample the stream banks, degrading the habitat, and even trample individual fish along the stream margins. This allotment is not currently being used by livestock but could be reactivated under the terms of the EIS. Livestock grazing occurs on many allotments that contain potential habitat that could be stocked with Gila topminnow as part of recovery efforts.

### Indirect Effects

Livestock grazing of upland areas within the Tule Creek watershed on the Boulder Creek allotment may be contributing to the severity and frequency of flooding that alters the stream morphology and vegetative composition. Flooding during 1993 severely depressed the topminnow population in Tule Creek. The degree to which livestock grazing contributed to the flood severity is not clear. Much of the watershed for Tule Creek is extremely rocky and soil compaction by livestock may not be a factor; however, vegetation reduction may be a contributing factor.

## Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Development of private lands, sale and development of state lands, livestock grazing, groundwater pumping and exotic fish contamination of potential reintroduction sites are continuing threats to the species within the action area. Planning is in place to facilitate reintroduction efforts for the species into suitable habitat sites in the Black Canyon and Lake Pleasant Resource Conservation Areas as described in the Phoenix RMP/EIS.

Conclusion

After reviewing the current status of the Gila topminnow, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Eastern Arizona Grazing EIS, as proposed, is not likely to jeopardize the continued existence of the Gila topminnow. BLM has cooperated in the reintroduction of the species and provided protection for the Tule Creek population.

Incidental Take Statement

Sections 4(d) and 9 of EPA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The BLM has a continuing responsibility to regulate the activity covered by this incidental take statement. If the BLM (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

**Amount or Extent of Incidental Take**

The Service anticipates that renewed grazing activities on the Boulder Creek allotment will result in the incidental take of Gila topminnow from changes in water quality and quantity (i.e., increased sedimentation). Incidental take of the Gila topminnow will be difficult to detect for the following reasons: dead fish are difficult to find, cause of death may be difficult to determine, and losses may be

masked by seasonal fluctuations in numbers or other causes. Take will be considered exceeded if one or more of the following occur: (1) More than 10 dead Gila topminnow are found annually in the 300 meter stretch of Tule Creek below the exclosure, when cattle are present; or (2) if headcuts originate in cattle use areas; or (3) if the grazed portion of Tule Creek is found to be in unsatisfactory condition based on BLM criteria for classification of allotments.

**Effect of the Take**

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the Gila topminnow.

**Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the take of Gila topminnow.

1. Maintain riparian exclosure of cattle from habitat in Tule Creek.

2. Monitor the fish community and habitat in Tule Creek including the exclosure and grazed riparian zones below the exclosure.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

The following term and condition implements reasonable and prudent measure number 1:

1.1. The fences of the riparian exclosure shall be inspected and maintained at least twice annually when cattle are present.

The following term and condition implements reasonable and prudent measure number 2:

2.1 The BLM shall conduct fish habitat monitoring on Tule Creek every 3 years to determine habitat trends.

2.2. The grazed portions of occupied habitat in Tule Creek shall be monitored annually for habitat condition and to document any erosional features such as sloughed banks.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than 10 individual Gila topminnow will be directly taken, that no headcuts will occur in cattle use areas, and that the riparian habitat in Tule Creek will remain in satisfactory condition. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The BLM must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

**Conservation Recommendations**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Vegetation utilization by livestock should be measured and monitored in the grazed portion of Tule Creek. Should problems arise, this information can be related to the condition of the watershed and riparian zones and could be used to identify potential causes and remedies.

## LITTLE COLORADO SPINEDACE (*Lepidomeda vittata*)

**Status of the Species (Range-wide)**

The Little Colorado spinedace was listed as a threatened species on September 16, 1987. Critical habitat was designated for portions of East Clear Creek, Chevelon Creek and Nutrioso Creek. At the time of listing, populations of the species were known from the East Clear Creek drainage, lower Chevelon Creek, Silver Creek, Nutrioso Creek and portions of the Little Colorado River. Since that time, an additional population was located in Rudd Creek, a tributary to Nutrioso Creek. The draft recovery plan for the species was sent out for public comment in August 1994. The recovery plan has not yet been finalized.

The spinedace is one of four species of the genus *Lepidomeda* in the tribe Plagopterini of the family Cyprinidae. One of these species is now extinct. The Plagopterini also contains two monotypic genera, *Meda* and *Plagopterus*. The Plagopterini are restricted to portions of Arizona, Nevada, New Mexico and Utah (LaRivers 1962, Lee et al. 1980, Minckley 1973). Uyeno and Miller (1973) evaluated the karyotypes of the five remaining Plagopterini species and determined that *Meda* and *Plagopterus* are more closely related to each other than to the *Lepidomeda* species, and that the spinedace was more distinctly different from the other two *Lepidomeda* evaluated and probably arose earlier.

Mitochondrial DNA work on the spinedace was initiated in the 1990's that indicated the existence of three sub-groups identifiable by geographic area (Tibbits et al. undated). The East Clear Creek drainage formed one sub-group, Chevelon Creek the second, and the upper Little Colorado including Nutrioso and Rudd Creeks formed the third. The study concluded that the genetic patterns seen were likely the result of populations being isolated and differentiated by stochastic events. The East Clear Creek and Chevelon Creek sub-groups were more individually distinctive, likely the result of a higher degree of isolation and possess unique haplotypes. Individuals from the Little Colorado River sub-group are more similar and. possibly until very recently, there was one population with considerable gene flow when various dams and diversions increased local isolation. The cause or exact time of the isolation of the three sub-groups is not known (Tibbits et al. undated).

The spinedace was first described in collections made in 1871-1874 from the Little Colorado River drainage by the Wheeler Survey and was formally described in 1874 by E.D. Cope (Miller and Hubbs 1960). It is a small fish, adult males and females are generally less than 100 mm in total length and there is little size differentiation between the sexes, although females may on average be longer than males. The back and upper sides are olivaceous, bluish or lead grey with the venter being white and the sides silver with vertical black lines (Miller 1963).

The spawning period for spinedace is from May to June or July (Blinn 1993, Blinn and Runck 1990, Miller 1961, Minckley 1973, Minckley and Carufel 1967) although some females have been found to contain mature eggs as late as October (Minckley and Carufel 1967). Information from spinedace kept in a pond at the Flagstaff Arboretum indicate that adults there spawned three times in 1993 and 1994 (Blinn et al. 1994), but it is not certain if individual females spawn more than once.

Spawning at the Arboretum occurred during the day in the stream that feeds into the Arboretum pond. Small schools (4 to 40 individuals) would leave the pond and move into the stream. Gravel substrates were utilized and sediments were cleared

from spawning sites. No spawning was observed in pools containing fine sediments, or within areas with larger gravel and cobbles or aquatic vegetation. Water temperatures in the spawning areas averaged 21° centigrade (Blinn et al. 1994). Fry hatched about five days later, after which they moved to the shallow areas of the pond, usually near floating algal mats or other aquatic vegetation (Blinn et al. 1994). Factors affecting spawning that were identified included changes to water levels, turbidity, photoperiod and water temperature.

Young of the year spinedace reach half their adult size within 2 months. The average life expectancy, based on recapture information from the Arboretum pond, is 3 years (Blinn et al. 1994).

As with most aquatic habitats in the southwest, the Little Colorado River basin contained a variety of aquatic habitat types and is prone to rather severe seasonal and yearly fluctuations in water quality and quantity. Both mountain streams and lower gradient streams and rivers have provided habitat for the spinedace. Residual pools and spring areas are important refuges during periods of normal low water or drought. From these refuges, spinedace are able to recolonize other stream reaches during wetter periods. This ability to quickly colonize an area has been noted in the literature (Minckley and Carufel 1967) as well as in observations by others familiar with the species. Populations seem to appear and disappear over short time frames and this has made specific determinations on status and exact location of populations difficult. This tendency has been observed by both researchers and land managers (Miller 1963, Minckley 1965, Minckley 1973) and led to concerns in the 1960's and 1970's for the species survival.

As would be expected for a species adapted to fluctuating physical conditions, the spinedace is found in a variety of habitats (Blinn and Runck 1990, Miller 1963, Miller and Hubbs 1960, Nisselson and Blinn 1989). Whether occupancy of these habitats reflect the local preferences of the species or its ability to tolerate less than optimal conditions is not clear. Available information indicates that suitable habitat for the Little Colorado spinedace is characterized by clear, flowing pools with slow to moderate currents, moderate depths and gravel substrates (Miller 1963, Minckley and Carufel 1967). Cover from undercut banks or large rocks is often a feature. Spinedace have also been found in pools and flowing water conditions over a variety of substrates, with or without aquatic vegetation, in turbid and clear water (Denova and Abarca 1992, Nisselson and Blinn 1991). Spinedace are mid-water dwellers. During high water events, adult spinedace will utilize the lower end of riffles and the upper ends of pools and are positioned lateral to the current (Minckley 1984). It is during these high water events that recolonization of other areas of the stream can occur.

Aquatic and terrestrial insects form the basis of the spinedace diet (Runck and Blinn 1993), but they will also consume algae and detritus (Blinn and Runck 1990, Minckley and Carufel 1967). Spinedace are opportunistic feeders, using whatever is seasonally available (Runck and Blinn 1993). Foraging may take place both in the water column and on the bottom (Minckley and Carufel 1967).

The native fish fauna of the Colorado River Basin is largely composed of endemic species. The Little Colorado River fish fauna is typical of Basin fish faunas. Besides the spinedace, the speckled dace (*Rhinichthys osculus*), bluehead sucker (*Pantosteus discobolus*), Little Colorado River sucker (*Catostomus* sp.), roundtail chub (*Gila robusta*) and Apache trout (*Oncorhynchus apache*) were found in the mainstem and tributaries of the Colorado River Basin. In the last 100 years, at least 10 nonnative fish species have been introduced into spinedace habitats. These include rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*) and golden shiner (*Notemigonus crysoleucus*). Recent surveys in East Clear Creek have documented the presence of those three non-native species and brown trout (*Salmo trutta*) in the watershed (Denova and Abarca 1992). Data from research experiments and field observations indicate that at least the rainbow trout is a predator and potential competitor with the spinedace (Blinn et al. 1993). Data on interactions between other native or non-native fish species and spinedace have not been obtained.

As previously mentioned, the populations of spinedace have a tendency to appear and disappear from locations within their range. These disappearances can be quite sudden, in as little as a few weeks, and last several years. In the 1960's and early 1970's, known populations were so few that the species appeared to be threatened with extinction (Miller 1964, Miller and Lowe 1964, Minckley 1965, Minckley 1973). Between the surveys of the early 1960's and those of the 1970's, the spinedace reappeared in most of the known range (Minckley and Carufel 1967) but populations declined in the late 1970's. In surveys from the early 1980's, five extant populations were identified (Minckley 1984) including two new locations in Nutrioso Creek. The Silver Creek population has not been collected in several years. Populations in East Clear Creek have declined since 1983 (Denova and Abarca 1992) although there were increased reports of occurrence in the drainage after the flooding in 1993.

The spinedace was listed as a threatened species with habitat alteration and destruction, predation and competition with nonnative aquatic organisms, and recreational fishery management actions largely responsible for the need to list the species. Land management activities in the range of the species have not changed significantly since the species was listed and there have been very few section 7 consultations with the Forest Service or other Federal agencies conducted for this species. State and private lands make up a considerable part of the habitat for this species outside the East Clear Creek drainage. No habitat conservation plan for the

species has been proposed or is in development. The State of Arizona has acquired some private lands in the upper Little Colorado River drainage for wildlife purposes and there are management possibilities on those lands that could benefit the spinedace. Arizona also owns a portion of the lands supporting the Chevelon Creek population.

Since the spinedace was listed, the Rudd Creek population was discovered, and the Silver Creek population may have been lost. A refugium population for Rudd Creek fish has been established at the Flagstaff Arboretum. No refugia populations for the other two genetic units exist.

The status of the spinedace has not significantly improved since listing. The protections that could be afforded the species by Arizona's purchase of lands and water rights in the Rudd Creek area may result in some improvements to habitat that would benefit the species. The issue of competition and predation on spinedace by introduced trout species has been partially addressed in a biological opinion dealing with stocking of rainbow trout for recreational purposes. While the result of that consultation may have effects that reduce the risk to spinedace from newly released trout, it does not address the resident trout populations. Research into the extent of the competition and predation between spinedace and trout is scheduled to start in 1996.

It is very difficult to document the actual status of spinedace populations. The apparently inherent wide fluctuations in population size make it difficult to assess the health of each population and difficult to determine the effects of specific land management activities. The possible loss of the Silver Creek population is a significant event because it represented an isolated population and the newly discovered Rudd Creek population is part of the upper Little Colorado River complex. The Little Colorado-Nutrioso Creek-Rudd Creek population appeared to be holding its own in 1993; however, increases in non-native trout in some areas was noted. The Chevelon population had declined significantly by 1993 (AZGFD 1994) from much higher numbers in 1990-91 (AZGFD 1992). The East Clear Creek population had declined by 1993 (AZGFD 1994), but apparently increased with the flooding in 1993-94. Drought conditions in 1996 may reverse that gain and put additional stress on all known populations.

**Status of the Species (In the Action Area)**

The BLM manages isolated parcels of public lands on 17 grazing allotments that are crossed by drainages that contain occupied habitat for the Little Colorado River spinedace, including Chevelon Creek, East Clear Creek, Silver Creek and the Little Colorado River. Within the action area, the Little Colorado River and Silver Creek are considered historic habitat. Seven allotments contain potential habitat for the species.

Surveys were conducted in Silver Creek between Snowflake and the confluence with the Little Colorado River and along the Little Colorado River wherever water was found upstream to St. Johns by BLM and AZGFD personnel in 1990. No spinedace were collected from BLM lands during these survey efforts. Spinedace were collected in the Little Colorado River above the confluence with Nutrioso Creek. Spinedace have not been collected from Silver Creek since 1965.

Critical habitat has been designated for this species. However, none of the critical habitat is on grazing allotments administered by BLM.

## Effects of the Action

Continued implementation of the Eastern Arizona Grazing EIS may adversely affect Little Colorado River spinedace potential habitat on 7 allotments.

### Direct Effects

Livestock grazing year-long along streams can degrade riparian condition. Cattle tend to congregate along streams during the summer. Cattle can trample the stream banks, altering the stream morphology, increasing sedimentation and degrading water quality. Objectives designed to improve riparian habitat conditions, tend to temper these potential impacts.

### Indirect Effects

Livestock grazing of upland areas within the watershed of potential habitat, may be contributing to the severity and frequency of flooding that alters the stream morphology and vegetative composition and turbidity and sediment loading of the streams. Objectives designed to improve watershed and riparian habitat conditions tend to temper these potential impacts. The authorization of livestock grazing on public lands within the potential habitat area influences to varying degrees livestock grazing on state and private lands in the area. Bureau-administered lands comprise only 12.9 percent of all of the lands on the seven allotments with potential habitat for this species. If livestock grazing were not authorized by BLM on the allotments which potentially contain habitat for this species, trespass livestock grazing would continue to occur unless BLM fenced out all the public lands.

## Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Adverse impacts associated with groundwater pumping, water diversion, exotic species and livestock grazing continue on all of the lands in the area. The majority of the land ownership in the area is private or State.

Conclusion

After reviewing the current status of the Little Colorado River spinedace, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Eastern Arizona Grazing EIS, as proposed, is not likely to jeopardize the continued existence of the Little Colorado River spinedace, or destroy or adversely modify its critical habitat. This species is not known to occur on allotments in the area covered by the EIS. Objectives to review grazing allotments and improve riparian conditions should limit impacts to the species' habitat.

Incidental Take Statement

Sections 4(d) and 9 of EPA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

**Amount or Extent of Take**

Although seven allotments contain potential habitat for spinedace, no spinedace have been located on any of the allotments within the action area. The Service does not anticipate the proposed action will incidentally take any Little Colorado River spinedace.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are

discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The BLM should identify factors that limit recovery potential of spinedace on lands under their jurisdiction and work to correct them.

## LESSER LONG-NOSED BAT (*Leptonycteris curasoae yerbabuenae*)

### Status of the Species (Range-wide)

The lesser long-nosed bat was listed (originally, as *Leptonycteris sanborni*; Sanborn's long-nosed bat) as endangered on September 30, 1988 (53 FR 38456). No critical habitat has been designated for this species. The lesser long-nosed bat is a small, leaf-nosed bat. It has a long muzzle and a long tongue, and is capable of hover flight. These features are adaptations to feed on nectar from the flowers of columnar cactus, such as the saguaro (*Carnegia gigantea*) and organ pipe cactus (*Lemaireocereus thurberi*), and from paniculate agaves, such as Palmer's agave (*Agave palmeri*) and Parry's agave (*A. parryi*) (Hoffmeister 1986). Palmer's agave exhibits many characteristics of chiropterophily, such as nocturnal pollen dehiscence and nectar production, light colored and erect flowers, strong floral order, and high levels of pollen protein with relatively low levels of nectar sugar concentrations. Nectar feeding bats are the principle pollinators defining seed set in Palmer's agave, though other pollinators my also be important.

The lesser long-nosed bat is migratory and found throughout its historic range, from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador. It occurs in southern Arizona from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County) and southeast to the Chiricahua Mountains (Cochise County) and south to Mexico. Roosts in Arizona are occupied from late April to September (Cockrum and Petryszyn 1991); the bat is not known to be present during winter in Arizona (Hoffmeister 1986). In spring, adult females, most of which are pregnant, arrive in Arizona gathering into maternity colonies. These roosts are typically at low elevations near concentrations of flowering columnar cacti. After the young are weaned these colonies disband, in July and August; some females and young move to higher elevations, primarily in the southeastern parts of Arizona near concentrations of blooming paniculate agaves. Adult males typically occupy separate roosts forming bachelor colonies. Males are known mostly from the Chiricahua Mountains but also occur with adult females and young of the year at maternity sites (Fleming 1995).

As indicated above, the lesser long-nosed bat consumes nectar and pollen of paniculate agave flowers and the nectar, pollen, and fruit produced by a variety of columnar cacti. These bats often forage in flocks. Throughout the night between foraging bouts the bats will rest in temporary night roosts (Hoffmeister 1986). Nectar of these cacti and agaves are high energy foods. Concentrations of food resources appear to be patchily distributed on the landscape and the nectar of each plant species utilized is only seasonally available. Cacti flowers and fruit are available during the spring and early summer, and blooming agaves through the summer; cacti occur in lower elevation areas of the Sonoran Desert region, and paniculate agaves are found in higher elevation desert areas, desert grasslands and shrublands, and into the oak woodland.

Lesser long-nosed bats appear to be opportunistic foragers and efficient fliers. The seasonally available food resources may account for the seasonal movement patterns of the bat. The lesser long-nosed bat is known to fly long distances from roost sites to foraging sites. Night flights from maternity colonies to flowering columnar cacti have been documented in Arizona at 15 mi, and in Mexico at 25 miles and 38 miles (Virginia Dalton, Tucson, Arizona, pers. comm. 1997; Yar Petryszyn, University of Arizona, Tucson, pers. comm. 1997). Lesser long-nosed bats have been recorded visiting individual blooming Palmer's agaves in excess of 1000 visits per night (Ronnie Sidner, Tucson, Arizona, pers.comm. 1997), while other agaves may not be visited at all (Liz Slauson, Desert Botanical Gardens, Phoenix, Arizona, pers. comm. 1997). Lesser long-nosed bats have been observed feeding at hummingbird feeders many miles from the closest potential roost site (Yar Petryszyn, pers. comm. 1997).

Loss of roost and foraging habitat, as well as direct taking of individual bats during animal control programs, particularly in Mexico, have contributed to the current endangered status of the species. Suitable day roosts and suitable concentrations of food plants are the two resources that are crucial for the lesser long-nosed bat (Fleming 1995). Caves and mines are used as day roosts. The factors that make roost sites useable have not yet been identified. Whatever the factors are that determine selection of roost locations, the species appears to be sensitive to human disturbance. Instances are known where a single brief visit to an occupied roost is sufficient to cause a high proportion of lesser long-nosed bats to temporarily abandon their day roost and move to another. Perhaps most disturbed bats return to their preferred roost in a few days. However, the sensitivity suggests that the presence of alternate roost sites may be critical when disturbance occurs. Interspecific interactions with other bat species may also influence lesser long-nosed bat roost requirements.

Known major roost sites include 16 large roosts in Arizona and Mexico (Fleming 1995). According to surveys conducted in 1992 and 1993, the number of bats estimated to occupy these sites was greater than 200,000. Twelve major

maternity roost sites are known for Arizona and Mexico. According to the same surveys, the maternity roosts are occupied by over 150,000 lesser long-nosed bats. The numbers above indicate that although there may be relatively large numbers of these bats known to exist, the relative number of known large roosts is small. Disturbance of these roosts and the food plants associated with them could lead to the loss of the roosts. The limited numbers of maternity roosts may be the critical factor in the survival of this species.

Status of the Species (In the Action Area)

No known roosts for this species occur in the action area. The closest known roost site to the action area is in the Slate Mountains on the Tohono-O'Odham Reservation, at least 15 miles south of the closest public lands. The portion of the action area north of the Phoenix metropolitan area is outside the area of known distribution of this species.

Surveys were conducted in 1993 of many of the abandoned mines in the north and west of Lake Pleasant. As part of a land exchange with ASARCO Inc., many abandoned mines were surveyed in the vicinity of the Ray Mine. This is within the action area but outside of the known range of the species. Mist netting has been conducted at various locations throughout the action area, but not within the known range of the species. No lesser long-nosed bats were captured.

Potential foraging habitat occurs throughout the action area where saguaro cactii exist. The southeastern portion of the action area also contains some agave populations which constitute potential foraging habitat for this species, however these allotments are outside the known distribution limits of the species.

Due to the lack of known roost sites for lesser long-nosed bats in the action area, the effects analysis focuses on impacts to potential foraging habitat for the species. Fifty-two allotments contain potential forage plants for lesser long-nosed bats, although only five of these allotments are within the distribution limits of the species. All of these allotments are classified as ephemeral, meaning that grazing is only allowed infrequently, in years when there is sufficient forage availability and moisture content to support cattle grazing.

Effects of the Action

Grazing may affect habitat for the lesser long-nosed bat on five allotments within the species' range. These areas contain saguaro cactii, but not agave. Grazing in areas with saguaro is dispersed. Livestock may inhibit survival of saguaro cactii by trampling seedlings under nurse plants (palo verde, ironwood, mesquite, etc.), by grazing nurse plants and removing protective cover, or by grazing the seedlings themselves. This effect is most likely to occur on relatively flat terrain. Small

individual saguaros could be eaten or trampled should they occur in an area where livestock concentrate, e.g. around water sources. Much of the saguaro occurrence in the Phoenix District portion of the action area is on relatively steep, rocky slopes where livestock use is infrequent and dispersed. Steep, rocky terrain inhibits cattle utilization of saguaro and shelters seedlings from trampling. These impacts are further tempered by the policy and guidance decisions and objectives that emphasize the improvement of watershed conditions.

The EIS does not preclude the construction of range improvements, e.g., fences and water sources, which could be proposed in potential foraging habitat for this species. These types of projects would be subject to further environmental analysis, site-specific surveys, and consultation with the Service, as necessary.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion.

Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Loss of potential foraging habitat, primarily through urbanization, is a continuing threat.

Conclusion

After reviewing the current status of the lesser long-nosed bat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the Eastern Arizona Grazing EIS, as proposed, is not likely to jeopardize the continued existence of the lesser long-nosed bat. No roost sites are known within the EIS area, which includes little of the species historic habitat.

Incidental Take Statement

Sections 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt

normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

**Amount and Extent of Take**

The Service anticipates incidental take of the lesser long-nosed bat will be difficult to detect for the following reasons: the species is wide-ranging and has small body size, finding a dead or impaired specimen is unlikely, losses may be masked by seasonal fluctuations in numbers or use of habitat, and the species roosts in habitat where detection is difficult. However, the following level of take of this species can be anticipated by loss of food plants due to livestock grazing and grazing improvement maintenance. The effect of cattle on the landscape can be conceived of being associated with the grazing preference numbers and the improvement maintenance. The anticipated level of incidental take in terms of these surrogate measures is expressed as maintenance of the current numbers and status of improvements. If the preference is increased or if additional improvements are constructed in foraging habitat beyond those existing at present, this level of incidental take would be exceeded.

**Effect of the Take**

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the species.

**Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measure are necessary and appropriate to minimize take of the lesser long-nosed bat:

1. Loss of lesser long-nosed bat food plants will be avoided to the greatest extent possible from grazing activities, including maintenance of livestock improvements.

**Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. The following terms and conditions will implement the reasonable and prudent measure:

   a. Assess the amount of food plants currently present within areas where livestock grazing is occurring. Adjust livestock grazing levels in order to maintain current levels of food plants for the bat.

   b. Grazing levels will not be increased until it is known that there is an upward trend in available food plants in an area.

Conservation Recommendations

Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommends that the following conservation recommendations be implemented by the BLM.

1. Protect, monitor, and survey major roost sites.

2. Develop a management plan for BLM administered areas within a radius of 50 miles (81 kilometers) around known roosts. The above reasonable and prudent measures, terms and conditions will be used as the bases for such a management plan.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendation.

## REINITIATION STATEMENT

This concludes formal consultation on the action outlined in the draft biological evaluation and draft environmental assessment. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new

species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

cc: State Director, Bureau of Land Management, Phoenix, AZ
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